

Name Key

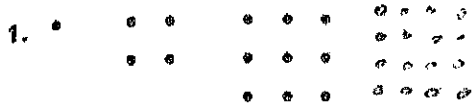
Date _____

LESSON
21

Practice B

For use with pages 72-78

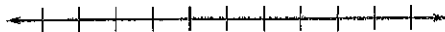
Sketch the next figure in the pattern.



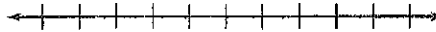
Describe a pattern in the numbers. Write the next number in the pattern.

Graph the pattern on a number line.

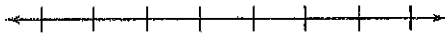
5. 113, 224, 335, 446, ... 557



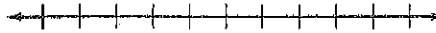
6. 4, 6, 9, 13, 18, ... 24



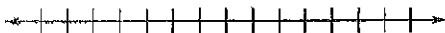
7. $\frac{1}{3}, \frac{3}{4}, \frac{5}{5}, \frac{7}{6}, \frac{9}{7}, \dots$



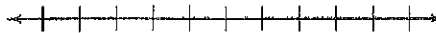
8. $\frac{7}{8}, \frac{6}{7}, \frac{5}{6}, \frac{4}{5}, \frac{3}{4}, \dots$



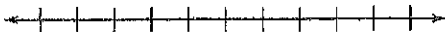
9. 3, 0, -3, -6, ... -9



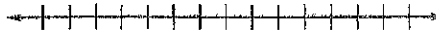
10. 1, 4, 9, 16, ... 25



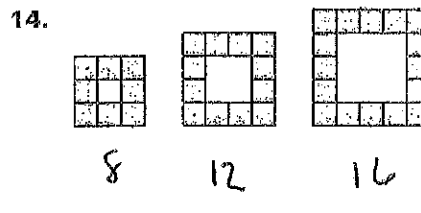
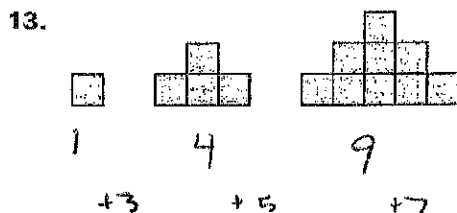
11. $2, 5, 11, 23, \dots$ 47
 $\begin{matrix} +3 & +6 & +12 \\ \times 2 + 1 & \times 2 + 1 & \times 2 + 1 \end{matrix}$



12. ~~2, 3, 5, 7, 11, 13~~ prime



The first three objects in a pattern are shown. How many squares are in the next object?



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LESSON
2.1**Practice B** *continued*
For use with pages 72-78

Show the conjecture is false by finding a counterexample.

15. The quotient of two whole numbers is a whole number. $\alpha \frac{2}{3}$
16. The difference of the absolute value of two numbers is positive, meaning $|a| - |b| > 0$. $b = 5 + a = 3$

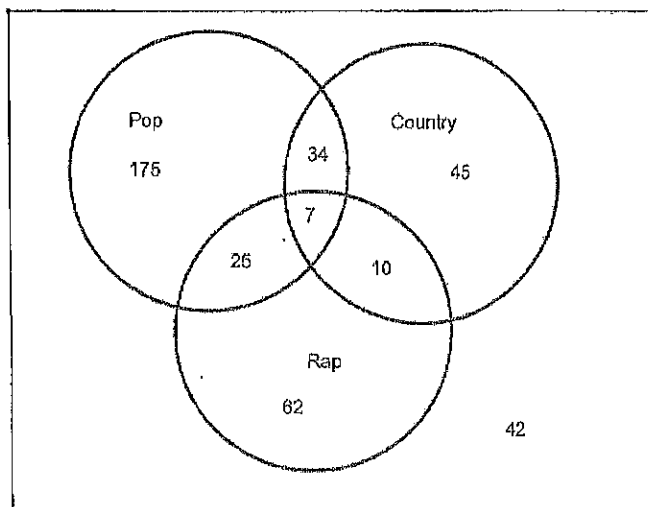
17. If $m \neq -1$, then $\frac{m}{m+1} < 1$. m is negative $\alpha m = -4$ $\frac{-4}{-3} = \frac{4}{3} > 1$

18. The square root of a number x is always less than x .

$\alpha x = \frac{1}{9}$ $\sqrt{x} = \frac{1}{3}$ $\frac{1}{3} > \frac{1}{9}$

Use the Venn diagram to answer the following questions about music preference.

A group of teens were questioned about music preference. The results are shown in the Venn diagram.



- 400 How many teens were surveyed?
- 42 How many teens listened to none of the types of music?
- 7 How many listened to all 3 types of music?
- 32 How many listened to pop and rap?
- 296 How many listened to pop or country?
- 358 How many listened to pop, rap, or country?

$$400 - 42$$

Complete the following truth tables.

 $\sim p \rightarrow q$

p	q	$\sim p$	$\sim p \rightarrow q$
T	T	F	T
T	F	F	T
F	T	T	T
F	F	T	F

 $q \rightarrow p$

p	q	$q \rightarrow p$
T	T	T
T	F	T
F	T	F
F	F	T

 $\sim p \vee q$

p	q	$\sim p$	$\sim p \vee q$
T	T	F	T
T	F	F	F
F	T	T	T
F	F	T	T

 $\sim p \wedge \sim q$

p	q	$\sim p$	$\sim q$	$\sim p \wedge \sim q$
T	T	F	F	F
T	F	F	T	F
F	T	T	F	F
F	F	T	T	T

LESSON 22 Practice B For use with pages 79-85

Rewrite the conditional statement in if-then form.

1. It is time for dinner if it is 6 P.M. *If it is 6pm, then it is time for dinner.*
2. There are 12 eggs if the carton is full. *If the carton is full, then there are 12 eggs.*
3. An obtuse angle is an angle that measures more than 90° and less than 180° .
4. The car runs when there is gas in the tank. *If an angle is obtuse, then it measures more than 90° & less than 180° .*

If there is gas in the tank, then the car runs.

Write the converse, inverse, and contrapositive of each statement.

5. If you like hockey, then you go to the hockey game.

Converse: If you go to the hockey game, then you like hockey.
Inverse: If you do not like hockey, then you do not go to the hockey game.
Contrapos: If you do not go to the hockey game, then you do not like hockey.

6. If x is odd, then $3x$ is odd.

Converse: If $3x$ is odd, then x is odd.

Inverse: If x is not odd, then $3x$ is not odd.
(even) (even)

Contrapositive: If $3x$ is not odd, then x is not odd.
(even) (even)

Decide whether the statement is true or false. If false, provide a counterexample.

7. The equation $4x - 3 = 12 + 2x$ has exactly one solution. *T*
8. If $x^2 = 36$, then x must equal 18 or -18. *F $x = 6$ or -6*
9. If $m\angle A = 122^\circ$, then the measure of the supplement of $\angle A$ is 58° . *T*
10. Two lines intersect in at most one point. *T*

Write the converse of each true statement. If the converse is also true, combine the statements to write a true biconditional statement.

11. If an angle measures 30° , then it is acute.

(This one could be debatable)
If 2 distinct lines intersect, then it is in at most one point.

12. If two angles are supplementary, then the sum of their measures is 180° .
If 2 \angle s sum is 180° , then they are supplementary.

Bicondi: Two \angle s are supplementary iff the sum of their measures is 180° .

13. If two circles have the same diameter, then they have the same circumference.

14. If an animal is a panther, then it lives in the forest.

LESSON 23 Practice B For use with pages 86-93

Determine if statement (3) follows from statements (1) and (2) by either the Law of Detachment or the Law of Syllogism. If it does, state which law was used. If it does not, write invalid.

- Detach.* 1. (1) If an angle measures more than 90° , then it is not acute.
 (2) $m\angle ABC = 120^\circ$
 (3) $\angle ABC$ is not acute.

- Invalid* 2. (1) All 45° angles are congruent.
 (2) $\angle A \cong \angle B$
 (3) $\angle A$ and $\angle B$ are 45° angles.

- Detach.* 3. (1) If you order the apple pie, then it will be served with ice cream.
 (2) Matthew ordered the apple pie.
 (3) Matthew was served ice cream.

- Syllogism* 4. (1) If you wear the school colors, then you have school spirit.
 (2) If you have school spirit, then the team feels great.
 (3) If you wear the school colors, then the team will feel great.

- Invalid* 5. (1) If you eat too much turkey, then you will get sick.
 (2) Kinsley got sick.
 (3) Kinsley ate too much turkey.

- Syllogism* 6. (1) If $\angle 2$ is acute, then $\angle 3$ is obtuse.
 (2) If $\angle 3$ is obtuse, then $\angle 4$ is acute.
 (3) If $\angle 2$ is acute, then $\angle 4$ is acute.

In Exercises 7-10, decide whether *inductive* or *deductive* reasoning is used to reach the conclusion. *Explain your reasoning.*

7. Angela knows that Walt is taller than Peter. She also knows that Peter is taller than Natalie. Angela reasons that Walt is taller than Natalie. *Deduct.*
8. Josh knows that Brand X computers cost less than Brand Y computers. All other brands that Josh knows of cost less than Brand X. Josh reasons that Brand Y costs more than all other brands. *Deduct.*
9. For the past three Wednesdays, the cafeteria has served macaroni and cheese for lunch. Dana concludes that the cafeteria will serve macaroni and cheese for lunch this Wednesday. *Induct.*

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LESSON
2.3**Practice B** *continued*
For use with pages 86–93

10. If you live in Nevada and are between the ages of 16 and 18, then you must take driver's education to get your license. Anthony lives in Nevada, is 16 years old, and has his driver's license. Therefore, Anthony took driver's education.

Deduction

In Exercises 11 and 12, state whether the argument is valid.
Explain your reasoning.

11. Jeff knows that if he does not do his chores in the morning, he will not be allowed to play video games later the same day. Jeff does not play video games on Saturday afternoon. So Jeff did not do his chores on Saturday morning.

Invalid (It doesn't say that he is not allowed, just that he is not playing)

12. Katie knows that all sophomores take driver education in her school. Brandon takes driver education. So Brandon is a sophomore.

Invalid (Other students could take Driver's Ed.)

In Exercises 13–16, use the true statements below to determine whether you know the conclusion is true or false. Explain your reasoning.

If Dan goes shopping, then he will buy a pretzel.

If the mall is open, then Jodi and Dan will go shopping.

If Jodi goes shopping, then she will buy a pizza.

The mall is open.

13. Dan bought a pizza.

F

14. Jodi and Dan went shopping.

T

15. Jodi bought a pizza.

T

16. Jodi had some of Dan's pretzel.

F

17. **Robotics** Because robots can withstand higher temperatures than humans, a fire-fighting robot is under development. Write the following statements about the robot in order. Then use the Law of Syllogism to complete the statement, "If there is a fire, then ____." *The robot extinguishes the fire.*

- A. If the robot sets off the fire alarm, then it concludes there is a fire.
B. If the robot senses high levels of smoke and heat, then it sets off a fire alarm.
C. If the robot locates the fire, then the robot extinguishes the fire.
D. If there is a fire, then the robot senses high levels of smoke and heat.
E. If the robot concludes there is a fire, then it locates the fire.

D → B → A → E → C